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Matching Selection Criteria And Ultimate Vocational Criteria For Officers In The Belgian Armed Forces

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Summary: Before 1990, the military context of employment was relatively uniform. Dramatic changes since then - a new vision on leadership, and the multiple vacancies for applicant officers - gave raise to the question if differentiation in selection criteria would not be more appropriate than the overall procedure in use, given the (hypothesized) differentiation in ultimate vocational criteria. This question falls apart into two questions: 1) which are those ultimate criteria? and 2) which of them apply to whom and to what extent?

In a first step, an inventory of criteria ought relevant was drawn, resulting in a list of 118 criteria. In a second step, factor analysis was used to regroup these criteria on the basis of common latent factors. Six factors were found; corresponding to the "Big Five" of personality and one military factor. In a third step, the relative importance of those criteria was assessed and, finally, discriminant analysis was used to distinguish between "kinds" of officers on the basis of those common factors. These "kinds" refer to three different aspects: the status, the studies done as applicant-officer, and the different Services, Specialties, Arms and Type of units.

Introduction

The overall ultimate criterion that was used since a long time in the recruitment was: having the necessary aptitudes to do his job in difficult and stressful circumstances, i.e. leading a small group of people.

Intermediate criteria (in reversed order) were 1) the results at the end of the instruction period in the Arm Training Center (ATC) and, 2) at the end of the studies at the Royal Military Academy (RMA). In this sense, selection was intended to predict succes in that intermediate criterion.

Based on factor analytic research, that global criterion was operationalized at selection level in the evaluation of: 1) intelligence, 2) sense of responsibility, 3) self confidence, 4) social behavior in (small) groups and 5) motivation. The weigh of each factor has been determined by regression analysis and was the same for every applicant, irrespective of his category and position (e.g. career officer versus temporary officer or enlisted officer).

The problem

Given that new categories of officers had been created and that the geopolitical situation had changed, leading to a new type of missions - i.e. peace support operations - some officers responsible for the selection of officer applicants were asking for a differential approach. Moreover, the general staff had decided to introduce a new concept of leadership that relied more on human relations. So, we wondered if it was not necessary to review the operationalization of the selection criteria taking into account a more specific definition of the ultimate vocational criterion and the fact that applicants were recruited in different populations for different career types. For example, according to Vervaeke (1992) predictive validity for ATC was .40 but the correlation with praxis in the unit was only .29. This means that different things are evaluated in both settings.

We will not enter here into the discussion of how to operationalize criteria on a conceptual level (single versus multiple criteria, traits versus behavior, etc).

Thus, the two problems at hand are:

1. What are relevant criteria in the evaluation of an officer?
2. Are there differences in criteria to be taken into account according to differences in the "typology" of officers? With respect to the latter, we considered differences in 1) status (career type), 2) studies done as applicant officer, and 3) type of Service/Specialty/Arm/subtype. Figure 1 shows the "taxonomy" of officers types existing in the Belgian Armed Forces.

Problem 1: A need for new (selection) criteria?

The procedure we used to determine the ultimate succes factors was done in four steps as follows. First, we drew an inventory of all the selection criteria in use. Running through all the selection tests revealed 29 different specific criteria; for example, capability to organize, verbal memory, achievement motivation, technical insight, self confidence.

Second, we looked at the criteria used for the evaluation in the ATC, the RMA and in the bi-annual evaluation of officers in the units. In this second step, we identified 18 new criteria; for example, creativity, authority, loyalty, sense for public relations. Thus, taken together with the

selection criteria, we have 47 different criteria in total, which can be considered as "general applicable".

In a third step, we asked all staff sections of the Services involved in personnel management, and all the commanders of military schools and ATCs to sent us a list of the criteria they ought important for the "kind" of officers they were responsible for. In order to avoid overlap we gave them the list with the 47 criteria already determined. We received an answer of 101 officers representing all services concerned with the problem at hand. Together, they are "responsible" for 71 new criteria. Thus, at the end we had 118 more or less different criteria in total. Contrary to what we expected, those new criteria were not so "Service specific" but reflect rather "trait-like" aspects. The most cited criteria were: disponibility, (intellectual) flexibility, caring for efficacy, pragmatism, care for material.

We considered this list of 118 items too long to be used as such. In other words, a systematic and objective grouping into classes is needed and/or a reduction by eliminating synonyms and very similar items as well. In this fourth step, we did the exercise first by ourself using the categories that are often used in developmental psychology: 1) cognitive aspects, 2) physical and psycho-motor aspects, 3) psycho-social aspects, 4) emotional and dynamic-affective aspects, and 5) values and norms. A pilot study with the collaboration of 15 officers with different background did not lead to a significant reduction nor to a consistent reduction neither. Thus, we were forced to switch to a statistical approach; more specifically, factor analysis.

Therefore, we asked all 370 officer-students of the RMA to think of an officer they knew very well but who was not their best friend nor their enemy. Self assessment was also forbidden in order to avoid effects of social desirability. They had to judge on a 7-point scale to which extent each criterion applies to that particular person (0= is not applicable at all/does never show that behavior, 6= completely applicable/shows always that behavior). The data of the 257 respondents were analyzed with SPSS. Unfortunately, the correlation matrix between all criteria was "ill conditioned", meaning that relatively small changes in the data could lead to relatively strong changes in the solution. This means that further results, based on these data, have to be interpreted with caution.

The Kaiser-Meyer-Olkin index was .86; meaning that the correlation matrix is well suited for factor analysis. Bartlett's index of sphericity was 20910.34 ($p < .000$); meaning that at least one common factor can be extracted from the data. A principal components analysis resulted in 30 factors with an eigen value greater than 1, explaining each from 22% to 1% of the variance and in total 71%. The scree-test indicated three possibilities: a solution with four, six or nine factors respectively. In each solution we considered

only those criteria with a factor loading of at least .30 (in other words, the factor explains at least 10% of variance of that item). The four-factor solution has been rejected because only 32% of the variance is explained by those factors and three of them were rather difficult to label.

The six factor solution explains 36% of the variance and was quite well interpretable. Five factors could be associated relatively well with the "big five" factors of personality. The sixth factor refers to typical military aspects. Conscientiousness is reflected in items that have to do with "*orientation towards the task*"; Agreeableness is associated with aspects of the "*ideal image of an officer*"; criteria that deal with "*orientation towards people*" are associated with Extraversion; the fourth factor regroups criteria of "*professional strength*" or Emotional Stability; aspects of *cognitive behavior* are clearly instances of Openness; finally the sixth and last factor is labeled as "*commitment*". Given that the nine factor solution has no substantial added value, we stick to the six factor solution. Figure 2 illustrates this factorial composition in terms of criteria.

Problem 2: A need for differentiation according to vision of the "end user".

This phase contains four steps. In step 1, we measured the relative importance of the 118 criteria by means of a questionnaire sent to several units of the Services and the State Police. In step 2, we checked the existence of groups of criteria associated with (groups of) "kinds" by means of hierarchical classes analysis. In step 3, we factor analyzed the answers stemming from respondents belonging to the units. And finally, in step 4, we used discriminant analysis to differentiate at best between "kinds" on the basis of the factors found in step 3.

In step 1, we sent the whole list of 118 criteria to a large sample of officers – i.e. about ten of every type and kind (cf. Figure 1 a, b and c); in total about 800 persons belonging to 45 different units were asked for their collaboration. Their task was to "score" on a 7 point scale (0= not important at all; 6= extremely important) each of those criteria using the critical incident method (Flanagan); i.e. to evaluate to which extent a given criterion is *critical* for the appropriate functioning of an officer of his "kind". We stressed the notion of "critical" to avoid answer patterns that reflect an idealistic view resulting in only high scores. By doing so, high scores correspond to important criteria and low scores to criteria "nice to have". We received about 240 answers that could be used for analysis. Although we received answers covering most the of the kinds in our taxonomy, such a low response quote forces us to be cautious in interpreting the results.

The hierarchical classes analysis in step 2 did not lead to meaningful clusters of criteria that could be associated with meaningful clusters of "kinds". In fact, we found already a good fit between a rank 1 solution (i.e. one cluster of criteria associated with one cluster of kinds) and the data, namely .93. This seems to indicate that all

criteria are considered relevant to each kind of officers. Differences can then only be attributed to differences in the extent to which a given criterion or subset of criteria is critical.

That is the reason why we returned to factor analysis in step 3: to determine factors as common denominators for the criteria. Thereby we hoped to detect the same six clusters of criteria as under problem 1. In other words, the new factor analysis can be seen as a validation study of the solution found when studying problem 1. Now, we found 22 factors with an eigenvalue greater than one; explaining each from 36.7% to 0.8% of the variance and together 77.5% of the variance. All factor loadings were higher than .30 and most of them even higher than .40. Given that the scree-test was not indicative for a certain number of factors, we considered only the six factor solution. The majority of the items still belong to the same factor as in the solution of problem 1. Most of the criteria that shifted from one factor to another could be reinterpreted in the sense of the factor they load on. The major problem was the "dissipation" of the factor Commitment. We explain this in the following way: the first solution was based on the perception of students while the second solution on is based on the judgement of "real" officers. Because the latter gave quite the same scores to the items referring to "commitment" there is a lack of variation, so that no factor could be extracted. Thus, the prominent factors correspond still to the Big Five.

As already said, in step 4 we tried to discriminate at best between "kinds" on the basis of the criteria. Because discriminant analysis can only be performed with a few variables, we regrouped the criteria into more "compact" variables corresponding to the factors, just by summing the scores of the items loading high on a particular factor.

We verified the differentiation between "kinds" according to the three aforementioned aspects: status, type of studies, and the four levels Service/Specialty/Arm/subtype (cf. Figure 1.a, 1.b. and 1.c. respectively).

Each analysis was performed twice: once including directly all variables and once stepwise, including one by one only statistical significant variables.

The distinction between conscript officers and active officers relies on one discriminant function, in which Cognitive Abilities (.75), Orientation towards People (.70) and Professional Strength (-.70) are dominant. Active officers are predominantly characterized by the first two factors and the conscript officers rather by the third one (means on the discriminant function are .24 and -.67 respectively). This effect is shown in Figure 3.a.

The classification power of the discriminant function is not that high: only 63% of the "profiles" are correctly classified (which is 25% better than classifying by

chance). In the stepwise procedure, only the Cognitive factor enters into the equation; thus cognitive aptitudes are seen as much more important for active officers than for conscript officers.

No significant function was found for discriminating between career officers, complementary officers and temporary officers. Thus, the respondents did not make a clear cut distinction between those kinds of officers on any of the six factors.

As shown in Figure 1, we considered five different types of studies. We found one significant discriminant function. As can be expected, the differentiation is essentially based on the Cognitive factor (-1.49), and to a lesser extent on Orientation towards People(-.85). Group means are -.94 (Industrial Engineers), -.86 (Civil Engineers), -.75 (Medical), -.48 (Naval College) and .48 (All Arms). Thus, in the first four cases the Cognitive abilities are much more important (as compared to the other ones) whereas in All Arms the Orientation towards People is dominant (relatively spoken) as shown in Figure 3.b. The classification power of the discriminant function is 38% better than by chance, which means that the distinction between groups is not that clear cut. This is proven by the stepwise procedure, because four factors enter into the equation: Cognitive Abilities, Orientation towards People, Commitment and Ideal Image.

When we compare the four Services and the State Police, one discriminant equation suffices, which creates a bipolar dimension with at the one end Commitment (1.21) and at the other end Professional Strength (-1.59) and Orientation towards the Task (-.71). Groups means are -1.01 (Navy), -.13 (Army), .05 (Medical Service), .10 (Air Force) and .95 (State Police). Thus, Navy officers ought Professional Strength and Orientation towards the Task much more important than the other factors, while officers of the State Police think just the opposite. In the opinion of the Medical Service officers, the mentioned factors seem equally important, resulting in a nearby zero position. The same holds to a lesser extent for the Army and the Air Force. Figure 3.c shows the relative position of each service based on the group means. In the stepwise procedure, four factors enter into the equation, showing that there is no clear distinction between services, except for Navy and State Police.

Next we considered a first level of specialties within the Services (see Figure 1.c, column 2). Unfortunately, the technical personnel and services of the Navy are not represented, and the technical personnel the Air Force is only represented by two respondents. Two discriminant functions are significant (although the second one only at $p < .10$). The first function contrasts Commitment (1.03) and Professional Strength (.62) with Orientation towards People(-.51) and Ideal Image (-.51) respectively. The second function opposes the combination of the Cognitive factor (.91) with Ideal image (.69) to a combination of Orientation towards People(-1.54) and towards the Task (-.54). The groups means on both dimensions are used as

coordinates in a bidimensional space (Figure 3.d). The first equation discriminates between entities of the Army especially on the first dimension; they are ordered from right to left according to their distance from the "contact line": combat troops – fire support – technical support – services. Moreover Cognitive Abilities are relatively more important in the fire support Arms than in the other ones. Differences in the Air Force are predominantly based on the second dimension: Flying Personnel is characterized by criteria that refer to the Cognitive factor and the Ideal image while Orientation towards People and to the Task is typical for Non Technical personnel; the position of Technical Personnel is nearer to the Flying Personnel than to the Non Technical Personnel. Although the differences are rather small, the less they are involved in "flying", the less is their Commitment/Professional Strength (and the more Ideal Image and Orientation towards People become important). In the Medical Service, both dimensions play a nearly equal important role, but the position of the Medical Corps is just the opposite of the Non Medical Officers. Given that there is only one kind of Naval Officers represented, it is not possible to speak in terms of between group contrast. The dominant characteristics in their profile are in the first place Ideal Image and Orientation towards People, and in the second place Cognitive Abilities. The stepwise procedure confirms the pattern we found in the direct approach. The classification power of the functions is weak, except for the Flying Personnel (84%) because several groups have a small number of representatives.

Discrimination at the level of the Arms of the Army is done on the basis of three significant functions. The first dimension contrasts Commitment (1.09) and Professional Strength (.75) with Orientation towards People (-.71). The second dimension opposes Orientation towards People (.88) and Cognitive Abilities (.77) to Orientation towards the Task (-1.29) while the poles of the third dimension are Orientation towards People (1.12) and towards the Task (1.08) versus Ideal image. The means of each group on the three dimensions is given in Figure 3.e. There is a striking difference between the Technical Evaluation Service at the one hand and all other Arms at the other hand based as reflected in the extreme position of the Evaluation Service on the first and second dimension. This configuration tends (again) to oppose the Combat Arms and Fire Support to the Technical Support Arms and Services, but the differences are rather small. The classification power of the discriminant functions is

also weak: only 26% better than by chance. All factors enter into the equations in the stepwise procedure; this confirms the pattern found by the direct procedure. Further, it shows that there are no clear differences in perception between Arms based on one of only a few dimensions.

Unfortunately, an analysis at the level of unit types has not been possible due to a lack of data.

Conclusion

The analysis of the evaluation documents revealed that the selection criteria used are a subset of the criteria ought important by the "end users".

In their opinion, there exists something like an overall prototype officer which can be characterized in terms of the Big Five of personality or its "militarized" counterpart plus one particular vocational factor.

In most of the cases studied, it was possible to discriminate between kinds of officers for each of the three aspects – status, studies, Services and its subdivisions - but the differentiation was rather weak, resulting also in a weak classification power.

At this moment, the overall conclusion seems to that there is no need to adapt the selection criteria as such, but the factors they are based on may be subject of a more fine grained study, especially because it is possible to situate them in a theoretical framework of personality and not only in an empirical, factor analytical one.

Neither seems it worth to introduce a differentiated approach in selection according to status, studies or specialty. With respect to the first aspect, due to the suspension of the conscript system, we have no longer conscript officers and the differentiation within the category of active officers was not significant at all. The evaluation of study based differences – which were predominantly characterized by Cognitive Abilities - is done by the academic entrance contest at the RMA. Notwithstanding the fact that the differences between specialties could be interpreted in a meaningful way, the differences are too small by now to be a valid argument for differentiation at the selection level. These conclusions do not mean that the study we undertook has been worthless. Its main advantage is to have disconfirmed in a scientific way some intuitive arguments in favor of differentiation and to have highlighted the ultimate vocational criteria as perceived by the "end user". Finally, given that the training at ATC level is by definition oriented towards a particular type of Arm or Specialty, it would be wise to do this study again at the level of the intermediate criteria.

Figure 1. Taxonomy of officer types**a. Based on status**

Status	Type
Active Officer	Career Officer
	Complement Officer
	Temporary Officer
Reserve Officer	

b. Based on studies (Career Officers only)

School	Division
RMA	All Weapons (Military & Social Sciences)
	Polytechnics (Civil Engineer)
Elsewhere	Industrial Engineer
	Medical (Physician, dentist, pharmacist)
	Nautical College

c. Based on Service/Arm or Specialty

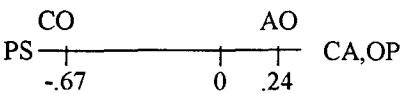
Service	Specialty	Arm	Subtype
Army	Combat	Infantry	Light Infantry
			Mechanized Infantry
			Paratroopers
	Fire support	Armored Troops	Reconnaissance
			Tank
		Artillery	Field Artillery
			Air Defence (Msl)
	Technical Support	Engineer	Air Defence (Guns)
Air Force	Services	Lighth Aviation	Supply
			Mechanics
			Transport
	Administrative	Infrastructure	
	Technical Evaluation		
	Pilots & Navigators		
Navy	Bridge Officer		
Medical Service	Medical		
Gendarmerie (Federal Police)	Non Medical		

Figure 2. Criteria as instances of the Big Five

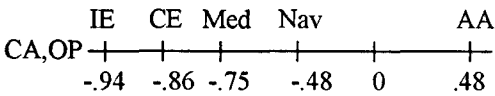
	Factor	Own name	Criteria
I	Extraversion/Introversion	Orientation towards People	Sicability, Communicative, Open to Others, Initiative, Self Confidence
II	Emotional Stability/ neurotiscism	Professional Strength	Achievement Motivation, Dare, Courage, Stamina, Authority,
III	Conscientiousness	Orientation towards the Task	Discipline, Sense of Responsibility, Care for Efficacy, Sense of Duty
IV	Agreeableness	Ideal Image	Style Flexibility, Polite, Team Spirit, Active Listening,
V	Openess	Cognitive Abilities	Analytic -, Synthetic-, Scientific Mind, Public Relations, Sense of Humor
VI	-----	Commitment	Servitude, Disponibility, Intrest for the Job,

Figure 3. Spatial representation of the groups means on the discriminant functions as dimensions.

3.a. Differences between status groups

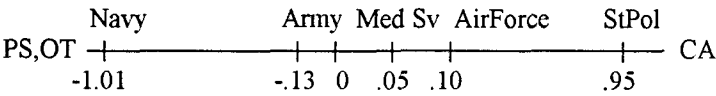


3.b. Differences between study based groups

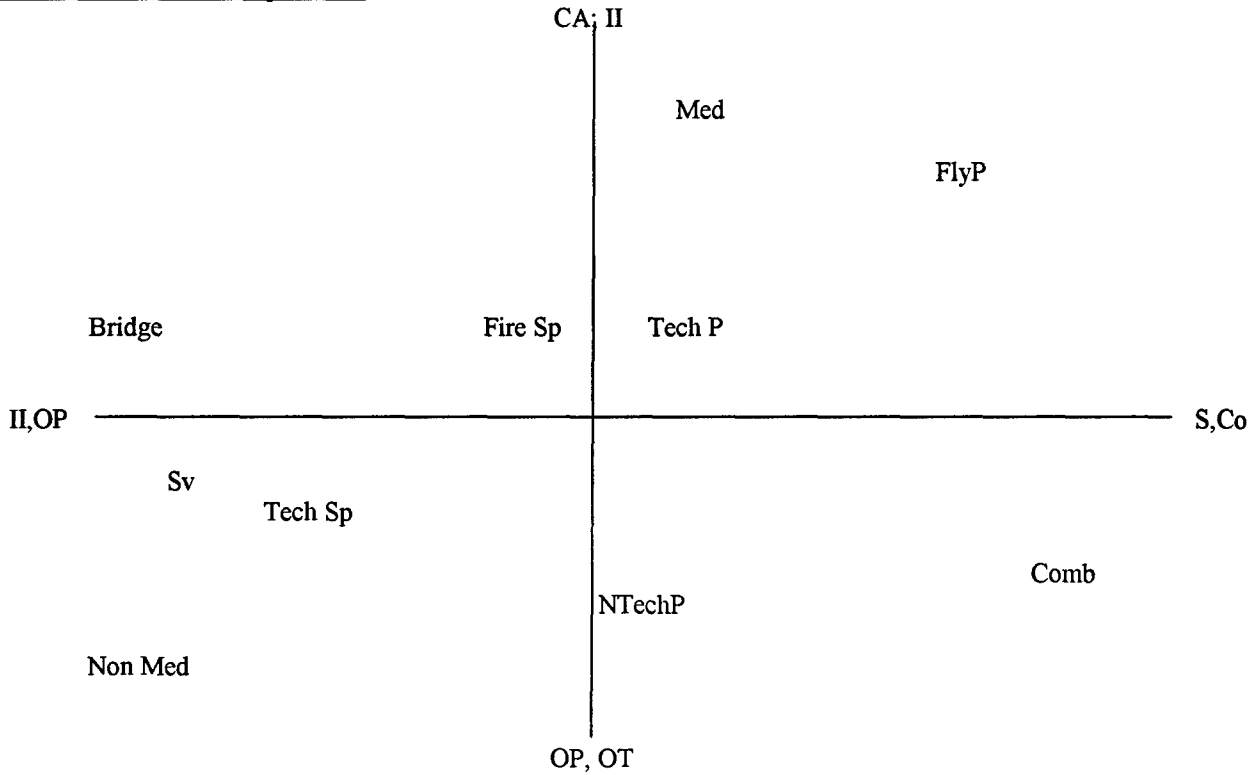


CA: Cognitive Abilities
PS: Professional Strength
OP: Orientation towards People
OT: Orientation towards Task
II: Ideal image
Co: Commitment

3.c. Differences between Services



3.d. Differences between Specialties

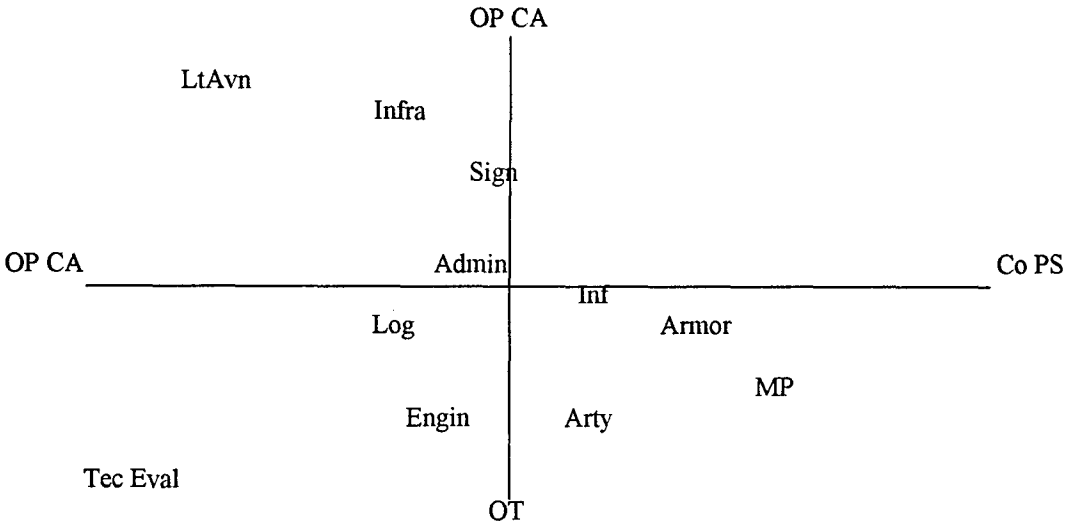


CA: Cognitive Abilities, PS: Professional Strength, OP: Orientation towards People OT: Orientation towards Task
II: Ideal image, Co: Commitment

Med: Medical Corps, FlyP: Flying Personnel, Bridge: Navy Bridge Personnel, Fire Sp: Fire Support, Tech P: Air Force Technical Personnel, Sv: Services, Tech Sp: Technical Support, NTechP: Air Force Non Technical Personnel, Comb: Combat Troops, Non Med: Non medical Officers of the Medical Service

3.e. Differences between Arms (Army only)

	Tec Ev	Infra	Admin	LtAvn	Signal	Log	Arty	Engin	MP	Armor	Inf
1.Co PS	-6.4	-.6	-.1	-1.3	-.3	-.8	.5	-.4	1.5	1.0	.4
2.OT OP	-2.6	1.0	.3	1.1	.7	-.2	-.9	-.7	-.8	-.1	0.0
3. OT OP	1.6	.1	-.2	-.1	0.0	-.3	-.5	-.2	1.0	.1	.6



Tec Ev: Technical Evaluation of Material, Infra: Infrastructure, Admin: Administration, LtAvn: Light Aviation, Signal: Signal Troops, Log: Logistics, Arty: Artillery, Engin: Engineers, MP: Military Police, Armor: Armored Troops, Inf: Infantry